



# UNITED STATES PATENT AND TRADEMARK OFFICE

UNITED STATES DEPARTMENT OF COMMERCE

United States Patent and Trademark Office

Address: COMMISSIONER FOR PATENTS

P.O. Box 1450

Alexandria, Virginia 22313-1450

www.uspto.gov

APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/504,828	08/16/2004	Noboru Sacki	10844-58US (204030)	2027
570. 7590 12/08/2008 PANITCH SCHWARZE BELISARIO & NADEL, LLP ONE COMMERCE SQUARE 2005 MARKET STREET, SUITE 2200 PHILADELPHIA, PA 19103				
EXAMINER				
TAL, XIYUNU				
ART UNIT		PAPER NUMBER		
1795				
MAIL DATE		DELIVERY MODE		
12/08/2008		PAPER		

**Please find below and/or attached an Office communication concerning this application or proceeding.**

The time period for reply, if any, is set in the attached communication.

# Office Action Summary

**Application No.**

10/504,828

**Applicant(s)**

SAEKI, NOBORU

**Examiner**

Xiuyu Tai

**Art Unit**

1795

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --  
**Period for Reply**

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

**Status**

- 1) ☒ Responsive to communication(s) filed on 16 August 2008.
- 2a) ☐ This action is **FINAL**. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

**Disposition of Claims**

- 4) ☒ Claim(s) 11-19 is/are pending in the application.
- 4a) Of the above claim(s) \_\_\_\_\_ is/are withdrawn from consideration.
- 5) ☐ Claim(s) \_\_\_\_\_ is/are allowed.
- 6) ☒ Claim(s) 11-19 is/are rejected.
- 7) ☐ Claim(s) \_\_\_\_\_ is/are objected to.
- 8) ☐ Claim(s) \_\_\_\_\_ are subject to restriction and/or election requirement.

**Application Papers**

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☒ The drawing(s) filed on 26 August 2008 is/are: a) ☒ accepted or b) ☐ objected to by the Examiner.
- Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
- Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

**Priority under 35 U.S.C. § 119**

- 12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All b) ☐ Some \* c) ☐ None of:
1. ☐ Certified copies of the priority documents have been received.
  2. ☐ Certified copies of the priority documents have been received in Application No. \_\_\_\_\_.
  3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

\* See the attached detailed Office action for a list of the certified copies not received.

**Attachment(s)**

- 1) ☐ Notice of References Cited (PTO-892)
- 2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
- 3) ☐ Information Disclosure Statement(s) (PTO-8508)
- Paper No(s)/Mail Date \_\_\_\_\_

- 4) ☐ Interview Summary (PTO-413)
- Paper No(s)/Mail Date \_\_\_\_\_
- 5) ☐ Notice of Informal Patent Application
- 6) ☐ Other: \_\_\_\_\_

**DETAILED ACTION**

***Response to Arguments***

1. A request for continued examination under 37 CFR 1.114, including the fee set forth in 37 CFR 1.17(e), was filed in this application after final rejection. Since this application is eligible for continued examination under 37 CFR 1.114, and the fee set forth in 37 CFR 1.17(e) has been timely paid, the finality of the previous Office action has been withdrawn pursuant to 37 CFR 1.114. Applicant's submission filed on 9/30/2008 has been entered.
2. Applicant's arguments filed 9/30/2008 have been fully considered but they are not persuasive.
3. In response to the argument that Koinuma et al teaches away "a pair of opposing discharge electrodes each having a pointed tip end to produce corona" for surface treatment, it should be noted that utilizing needle/sharp tip electrodes to generate corona discharge is well known method as taught by Koinuma and Hayashi. Furthermore, Koinuma states that the device/method of Koinuma is advantage to a fine processing by confining plasma in a minute region (col. 1, line 14-17& col. 2, line 14-20). However, the instant application does not claim to treat a minute region as disclosed by Koinuma. Therefore, utilizing a well known method of generating corona discharge from needle electrodes is within ordinary skill in the art and Koinuma teaches the same.

***Claim Rejections - 35 USC § 103***

4. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

5. The factual inquiries set forth in *Graham v. John Deere Co.*, 383 U.S. 1, 148 USPQ 459 (1966), that are applied for establishing a background for determining obviousness under 35 U.S.C. 103(a) are summarized as follows:

1. Determining the scope and contents of the prior art.
2. Ascertaining the differences between the prior art and the claims at issue.
3. Resolving the level of ordinary skill in the pertinent art.
4. Considering objective evidence present in the application indicating obviousness or nonobviousness.

6. This application currently names joint inventors. In considering patentability of the claims under 35 U.S.C. 103(a), the examiner presumes that the subject matter of the various claims was commonly owned at the time any inventions covered therein were made absent any evidence to the contrary. Applicant is advised of the obligation under 37 CFR 1.56 to point out the inventor and invention dates of each claim that was not commonly owned at the time a later invention was made in order for the examiner to consider the applicability of 35 U.S.C. 103(c) and potential 35 U.S.C. 102(e), (f) or (g) prior art under 35 U.S.C. 103(a).

7. Claims 11-19 are rejected under 35 U.S.C. 103(a) as being unpatentable over Koinuma et al (U.S. 5,221,427) in view of Hayashi et al (U.S. 5,578,130) and in further view of Daisuke (JP 7-118419).

8. Regarding claims 11 and 15, Koinuma et al disclose a plasma generating device and a method of plasma processing. The apparatus is operated under atmospheric pressure (ABSTRACT; col. 2, line 57-67). The method comprises steps of (1) applying a power source 14(Figure 1; col. 3, line44) to a pair of electrodes 11 and 12 (Figure 1; col. 3, line 41) to produce corona discharge under atmospheric pressure (col. 3, line 43-45; claim 1; ABSTRACT); (2) irradiating a surface of a workpiece with excited species including plasma produced by the corona discharge (col. 3, line 43-45; claim1; the substrate 1 is irradiated when plasma is generated by power source 14); and (3) establishing a magnetic field (magnet 3 in Figure 1; col. 3, line 51) in vicinity of the discharge electrodes 11 and 12. The apparatus of Koinuma is fully capable of performing the claimed function.

Koinuma fails to teach a pulsed voltage. However, Hayashi et al disclose a method for depositing film using plasma treatment. Hayashi teaches to use a pulse power supply to generate plasma (col. 5, line 8-10). Hayashi further states that a good coating film with a high membrane formation rate can be obtained by using a rectangular pulse power (col. 5, line 35-40). Therefore, it would be obvious for one having ordinary skill in the art to utilize the rectangular pulse supply as taught by Hayashi in the method/apparatus of Koinuma in order to achieve a better surface treatment for the substrate.

Koinuma/Hayashi fails to teach a pair of pointed end of discharge electrodes. However, Daisuke discloses a method for corona discharge treatment. The apparatus of Daisuke includes a discharge electrode 2 and a counter electrode 3 having tips 5

and 6, respectively and the discharge is generated from the electrode point 5 of the electrode 2 to the electrode point 6 of the counter electrode 3(Figure 1; paragraph [0012]). Although Koinuma does not disclose pointed end electrodes, the reference indicates that it is possible to use electrode having a shape of needle for easier corona discharge (col. 2, line 1-3 & col.5, line 54-57). Therefore, it would be obvious for one having ordinary skill in the art to utilize a pair of electrodes having tips as suggested by Daisuke in the method of Koinuma/Hayashi in order to make the initiation of discharge easier in the light of the teaching of Koinuma ((col. 2, line 1-3).

9. Regarding claims 12, 13, 16, and 17, Hayashi teaches a full-wave rectangular pulse power (col. 5, line 8-11). Therefore, it would be obvious for one having ordinary skill in the art to utilize the rectangular pulse supply as taught by Hayashi in the method/apparatus of Koinuma/Hayashi/Daisuke in order to achieve a better surface treatment for the substrate in the light of the teaching of Hayashi (col. 5, line 36-40).

10. Regarding claim 14, Koinuma teaches to supply a gas containing helium to the discharge space (col. 5, line 13-14; claim 1), reads on the instant claim.

11. Regarding claims 18 and 19, Koinuma teaches a permanent magnet 3 (Figure 1; col. 3, line 51), but fails to teach a pair of magnetic members connected to N and S poles of the permanent magnet, and the magnetic member being elongated to vicinities of the pointed ends of the pair of electrodes. Hayashi teaches a solenoid 61 which carries current as is known in the art. With the combination of solenoid 61 and permanent magnet 62 (Figure 1; col. 8, line 15-16), Hayashi indicates that the direction of magnetic field set up by a magnetic field-generating means is so selected as to

ensure that the active species in the plasma of the electric discharge atmosphere gas produced by an electric discharge are conveyed to the substrate (col. 6, line 52-57). The teaching of Hayashi is inherent that the combination of a solenoid 61 and a permanent magnet 62 can achieve the cited limitation of "magnetic members being elongated to vicinity of pointed end of the pair of discharge electrodes and a pair of pole piece being continuous to tip end of the magnetic members and forming a gap". Therefore, it would be obvious for one having ordinary skill in the art to include a pair of magnetic member (i.e. solenoid 61) as suggested by Hayashi into the method/apparatus of Koinuma/Hayashi/Daisuke in order to achieve high plasma density for better surface treatment in the light of the teaching of Hayashi (col. 6, line 60-61). It should be noted that the electrodes of Koinuma/Hayashi/Daisuke is configured to having a discharge electrode 2 and a counter electrode 3 having tips 5 and 6, respectively.

### ***Conclusion***

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Xiuyu Tai whose telephone number is 571-270-1855. The examiner can normally be reached on Monday - Friday, 7:30 AM - 5:00 PM.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Alexa Neckel can be reached on 571-272-1446. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.

/X. T./  
Examiner, Art Unit 1795

12/1/2008

/Alexa D. Neckel/  
Supervisory Patent Examiner, Art Unit 1795